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Environment



World Bans the Dirty Dozen Most Dangerous Chemicals

STOCKHOLM, Sweden, May 22, 2001 (ENS) - Today and tomorrow in Stockholm, a conference to sign the international Convention on Persistent Organic Pollutants (POPs) is taking place.

Officials from 120 countries and a host of environmental and civil society groups have gathered to celebrate the adoption of a treaty that will restrict a group of chemicals the United Nations has labelled the most dangerous in the world. The convention will enter into force once ratified by 50 countries.



Swedish Prime Minister Göran Persson (Photo courtesy [Earth Negotiations Bulletin \(ENB\)](#))

Opening the meeting, Swedish Prime Minister Göran Persson reminded delegates that their task is to help make the planet healthier and stronger, by stopping the use of poisons that threaten plants, animals and the environment. If we fail with environmental issues, then all other political work will be pointless, he said.

The treaty controls the production, import, export, disposal, and use of these toxic chemicals. It establishes tough international controls on an initial cluster of 12 chemicals, of which most are subject to

an immediate ban.

These are aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex, toxaphene, polychlorinated biphenols (PCBs), hexachlorobenzene, dioxins and furans.

Delegates gather in Stockholm's City Conference Centre, Folkets Hus (Photo courtesy [UNEP](#))

The global POPs Convention was negotiated within the framework of the United Nations Environment Programme (UNEP), and finalized in



December 2000 in Johannesburg, South Africa by delegates from 122 countries. The Swedish environment minister Kjell Larsson will sign the Convention on behalf of the European Community.

European Environment Commissioner Margot Wallström said today, "The POPs Convention is an environmental breakthrough, and it shows that the international community is on the right track in dealing with chemicals which are highly toxic and which accumulate in our bodies and the environment."

"I urge all the countries to sign and ratify the Convention as an absolute priority. The Convention is a step to a more sustainable world and nothing is more unsustainable than producing chemicals that harm our ability to have children," she said.

With opening of the treaty for signature, attention is now shifting to how quickly it will enter into force and how to fund implementation in developing countries.



Klaus Töpfer is executive director of the UN Environment Programme (Photo courtesy ENB)

Klaus Töpfer, executive director of the United Nations Environment Programme (UNEP), has called for entry into force by 2004. The environmental group World Wide Fund for Nature wants a more ambitious deadline of September next year, in time for the Rio+ 10 world sustainable development summit.

Early signs for entry into force are promising, with Canada taking an unprecedented lead by promising not only signature but also ratification of the convention tomorrow. A series of other countries

have committed to ratification as soon as possible.

The European Union and its 15 member nations are strongly committed to a rapid and effective implementation of the POPs Treaty by providing adequate technical and financial assistance to developing countries and countries with economies in transition.

This commitment is reflected in a set of Resolutions and Interim Measures and Arrangements to be adopted at Stockholm, which will set the stage for crucial activities up to the first Conference of the Parties.

As delegates were gathering in Stockholm this morning, 60 Greenpeace activists barricaded all entrances to the head office of the cement kiln company, Cementa, on Gotland Island off the Swedish coast.

Cementa plant on Gotland Island, Sweden (Photo courtesy [Greenpeace](#))

Twenty activists prevented the plant's managers from entering the office by chaining themselves to the office doors and demanded that Cementa abandon its plans to incinerate waste in the company's cement kiln.

As part of its international move against toxic Pops timed to coincide with the Stockholm meeting, Greenpeace is demanding that the Cementa plant stop all waste incineration and stop releasing toxic chemicals, including



persistent organic pollutants, into the environment.



The Stockholm Convention specifically states that burning of hazardous waste in cement kilns is a significant source of POPs.

Greenpeace activists were arrested yesterday in Lebanon and Thailand for protesting against continued releases of POPs into the environment. Activists in Turkey have been occupying the top of an incinerator stack since Monday morning.

Of all the pollutants released into the environment every year by human activity, POPs are among the most dangerous. They are highly toxic, causing an array of adverse effects, notably death, disease, and birth defects, among humans and animals. Specific effects can include cancer, allergies and hypersensitivity, damage to the central and peripheral nervous systems, reproductive disorders, and disruption of the immune system.

These highly stable compounds can last for years or decades before breaking down. POPs released in one part of the world can, through a repeated and often seasonal process of evaporation, deposit, evaporation, deposit, be transported through the atmosphere to regions far away from the original source.

In addition, POPs concentrate in living organisms through another process called bioaccumulation. Though not soluble in water, POPs are readily absorbed in fatty tissue, where concentrations can become magnified by up to 70,000 times the background levels. Fish, predatory birds, mammals, and humans are high up the food chain and so absorb the greatest concentrations.



There are alternatives to these toxics. Researchers in Arizona found that a mix of liquid dishwashing detergent and cooking oil kills sweetpotato whiteflies, and common home garden pests. (Photo by Jack Dykinga courtesy [U.S. Dept. of Agriculture Research Service](#))

While the control measures will apply to an initial list of 12 chemicals, a POPs Review Committee will consider

additional candidates for the POPs list on a regular basis. This will ensure that the Treaty remains dynamic and responsive to new scientific findings. Most of the 12 chemicals are subject to an immediate ban.

A health related exemption has been granted for DDT, which is still needed in many countries to control malarial mosquitoes. This will permit governments to protect their citizens from malaria a major killer in many tropical regions until they are able to replace DDT with chemical and non-chemical alternatives that are cost-effective and environmentally friendly.

Similarly, in the case of PCBs, which have been widely used in electrical transformers and other equipment, governments may maintain existing equipment in a way that prevents leaks until 2025 to give them time to arrange for PCB-free replacements. Although PCBs are no longer produced, hundreds of thousands of tons are still in use in such equipment.

In addition, a number of country specific and time limited exemptions have been agreed for other chemicals.

THE DIRTY DOZEN
A Fact Sheet Courtesy of UNEP

1. Aldrin: A pesticide applied to soils to kill termites, grasshoppers, corn rootworm, and other insect pests, aldrin can also kill birds, fish, and humans. In one incident, aldrin-treated rice is believed to have killed hundreds of shorebirds, waterfowl, and passerines along the Texas Gulf Coast when these birds either ate animals that had eaten the rice or ate the rice themselves. In humans, the fatal dose for an adult male is estimated to be about five grams. Humans are mostly exposed to aldrin through dairy products and animal meats. Studies in India indicate that the average daily intake of aldrin and its byproduct dieldrin is about 19 micrograms per person. The use of aldrin has been banned or severely restricted in many countries.
2. Chlordane: Used extensively to control termites and as a broad-spectrum insecticide on a range of agricultural crops, chlordane remains in the soil for a long time and has a reported half-life of one year. The lethal effects of chlordane on fish and birds vary according to the species, but tests have shown that it can kill mallard ducks, bobwhite quail, and pink shrimp. Chlordane may affect the human immune system and is classified as a possible human carcinogen. It is believed that human exposure occurs mainly through the air, and chlordane has been detected in the indoor air of residences in the U.S. and Japan. Chlordane is either banned or severely restricted in dozens of countries.
3. DDT: - Perhaps the most infamous of the POPs, DDT was widely used during World War II to protect soldiers and civilians from malaria, typhus, and other diseases spread by insects. After the war, DDT continued to be used to control disease, and it was sprayed on a variety of agricultural crops, especially cotton. DDT continues to be applied against mosquitoes in several countries to control malaria. Its stability, its persistence - as much as 50 percent can remain in the soil 10-15 years after application - and its widespread use have meant that DDT residues can be found everywhere; residual DDT has even been detected in the Arctic.

Perhaps the best known toxic effect of DDT is eggshell thinning among birds, especially birds of prey. Its impact on bird populations led to bans in many countries during the 1970s. Thirty-four countries have banned DDT, while 34 others severely restrict its use. Still, it has been detected in food from all over the world. Although residues in domestic animals have declined steadily over the last two decades, food-borne DDT remains the greatest source of exposure for the general population. The short-term acute effects of DDT on humans are limited, but long-term exposures have been associated with chronic health effects. DDT has been detected in breast milk, raising serious concerns about infant health.

4. Dieldrin: Used principally to control termites and textile pests, dieldrin has also been used to control insect-borne diseases and insects living in agricultural soils. Its half-life in soil is approximately five years. The pesticide aldrin rapidly converts to dieldrin, so concentrations of dieldrin in the environment are higher than dieldrin use alone would indicate. Dieldrin is highly toxic to fish and other aquatic animals, particularly frogs, whose embryos can develop spinal deformities after exposure to low levels. Dieldrin residues have been found in air, water, soil, fish, birds, and mammals, including humans. Food represents the primary source of exposure to the general population. For example, dieldrin was the second most common pesticide detected in a U.S. survey of pasteurized milk.
5. Dioxins: These chemicals are produced unintentionally due to incomplete combustion, as well during the manufacture of pesticides and other chlorinated substances. They are emitted mostly from the burning of hospital waste, municipal waste, and hazardous waste, and

also from automobile emissions, peat, coal, and wood. There are 75 different dioxins, of which seven are considered to be of concern. One type of dioxin was found to be present in the soil 10 - 12 years after the first exposure. Dioxins have been associated with a number of adverse effects in humans, including immune and enzyme disorders and chloracne, and they are classified as possible human carcinogens. Laboratory animals given dioxins suffered a variety of effects, including an increase in birth defects and stillbirths. Fish exposed to these substances died shortly after the exposure ended. Food, particularly from animals, is the major source of exposure for humans.

6. Endrin: This insecticide is sprayed on the leaves of crops such as cotton and grains. It is also used to control rodents such as mice and voles. Animals can metabolize endrin, so it does not accumulate in their fatty tissue to the extent that structurally similar chemicals do. It has a long half-life, persisting in the soil for up to 12 years. In addition, endrin is highly toxic to fish. When exposed to high levels of endrin in the water, sheepshead minnows hatched early and died by the ninth day of their exposure. The primary route of exposure for the general human population is through food, although current dietary intake estimates are below the limits deemed safe by world health authorities.
7. Furans: These compounds are produced unintentionally from many of the same processes that produce dioxins, and also during the production of PCBs. They have been detected in emissions from waste incinerators and automobiles. Furans are structurally similar to dioxins and share many of their toxic effects. There are 135 different types, and their toxicity varies. Furans persist in the environment for long periods, and are classified as possible human carcinogens. Food, particularly animal products, is the major source of exposure for humans. Furans have also been detected in breast fed infants.
8. Heptachlor: Primarily used to kill soil insects and termites, heptachlor has also been used more widely to kill cotton insects, grasshoppers, other crop pests, and malaria carrying mosquitoes. It is believed to be responsible for the decline of several wild bird populations, including Canadian Geese and American kestrels in the Columbia River Basin in the U.S. The geese died after eating seeds treated with levels of heptachlor lower than the usage levels recommended by the manufacturer, indicating that even responsible use of heptachlor may kill wildlife. Laboratory tests have also shown high doses of heptachlor to be fatal to mink, rats, and rabbits, with lower doses causing adverse behavioral changes and reduced reproductive success. Heptachlor is classified as a possible human carcinogen, and some two dozen countries have either banned it or severely restricted its use. Food is the major source of exposure for humans, and residues have been detected in the blood of cattle from the U.S. and from Australia.
9. Hexachlorobenzene (HCB): First introduced in 1945 to treat seeds, HCB kills fungi that affect food crops. It was widely used to control wheat bunt. It is also a byproduct of the manufacture of certain industrial chemicals and exists as an impurity in several pesticide formulations. When people in eastern Turkey ate HCB-treated seed grain between 1954 and 1959, they developed a variety of symptoms, including photosensitive skin lesions, colic, and debilitation; several thousand developed a metabolic disorder called porphyria turcica, and 14 percent died. Mothers also passed HCB to their infants through the placenta and through breast milk. In high doses, HCB is lethal to some animals and, at lower levels, adversely affects their reproductive success. HCB has been found in food of all types. A study of Spanish meat found HCB present in all samples. In India, the estimated average daily intake of HCB is 0.13 micrograms per kilogram of body weight.
10. Mirex: This insecticide is used mainly to combat fire ants, and it has

been used against other types of ants and termites. It has also been used as a fire retardant in plastics, rubber, and electrical goods. Direct exposure to mirex does not appear to cause injury to humans, but studies on laboratory animals have caused it to be classified as a possible human carcinogen. In studies mirex proved toxic to several plant species and to fish and crustaceans. It is considered to be one of the most stable and persistent pesticides, with a half life of up to 10 years. The main route of human exposure to mirex is through food, particularly meat, fish, and wild game.

11. Polychlorinated Biphenyls (PCBs): These compounds are used in industry as heat exchange fluids, in electric transformers and capacitors, and as additives in paint, carbonless copy paper, and plastics. Of the 209 different types of PCBs, 13 exhibit a dioxin-like toxicity. Their persistence in the environment corresponds to the degree of chlorination, and half-lives can vary from 10 days to 18 months. PCBs are toxic to fish, killing them at higher doses and causing spawning failures at lower doses. Research also links PCBs to reproductive failure and suppression of the immune system in various wild animals, such as seals and mink.

Large numbers of people have been exposed to PCBs through food contamination. Consumption of PCB contaminated rice oil in Japan in 1968 and in Taiwan in 1979 caused pigmentation of nails and mucous membranes and swelling of the eyelids, along with fatigue, nausea, and vomiting. Due to the persistence of PCBs in their mothers' bodies, children born up to seven years after the Taiwan incident showed developmental delays and behavioral problems. Similarly, children of mothers who ate large amounts of contaminated fish from Lake Michigan showed poorer short-term memory function. PCBs also suppress the human immune system and are listed as probable human carcinogens.

12. Toxaphene: This insecticide is used on cotton, cereal grains, fruits, nuts, and vegetables. It has also been used to control ticks and mites in livestock. Toxaphene was the most widely used pesticide in the U.S. in 1975. Up to 50 percent of a toxaphene release can persist in the soil for up to 12 years. For humans, the most likely source of toxaphene exposure is food. While the toxicity to humans of direct exposure is not high, toxaphene has been listed as a possible human carcinogen due to its effects on laboratory animals. It is highly toxic to fish; brook trout exposed to toxaphene for 90 days experienced a 46 percent reduction in weight and reduced egg viability, and long-term exposure to levels of 0.5 micrograms per liter of water reduced egg viability to zero. Thirty-seven countries have banned toxaphene, and 11 others have severely restricted its use.

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